

## PRODUCTION OF OPTICALLY ACTIVE ALCOHOL BY REDUCTION WITH ASYMMETRIC BORANE

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Inventor(s): MASUI MORIYASU

Applicant(s):: SHIONOGI & CO LTD

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### Abstract

**PROBLEM TO BE SOLVED:** To obtain an optically active alcohol which is useful as a medicine, agrochemical or the like in high asymmetric yield by asymmetric reduction of an unsymmetrical ketone with hydroborane in the presence of a chiral &beta;-aminoalcohol and a trialkoxyborane.

**SOLUTION:** (A) A compound formula I ( $R<1>$  and  $R<2>$  are each an organic residue different from each other) is reduced with (D) hydroborane in the presence of (B) a chiral &beta;-aminoalcohol of formula II [ $R<3>$  is an alkyl, a cycloalkyl, a (substituted) aryl;  $R<4>$  and  $R<5>$  are each H, an alkyl;  $R<6>$  is H, an alkyl, a cycloalkyl; \* is an asymmetric carbon] and (C) a compound of formula III ( $R<7>$  is an alkyl) to give an optically active alcohol of formula IV ( $R<1>$  and  $R<2>$  are each an organic residue same as  $R<1>$  and  $R<2>$  respectively). The component A is preferably, for example, acetophenone, propiophenone, phenacyl chloride, benzyl phenyl ketone. An  $\alpha$ -oxoketoxime derivative also may be used as a component A.

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